CLAIMS

1. A process meter for measuring at least one physical process variable, particularly a mass flow rate, density, viscosity, pressure, or the like, of a medium stored in a process container or flowing in a process line, the meter comprising:

- a transducer (10)
-- with a sensor arrangement (60) providing measurement signals (s_1, s_2)
--- which comprises at least a first sensor (17) providing at least a first measurement signal (s_1) in response to the physical process variable being measured, particularly to changes in the process variable, and
--- which further comprises at least a first temperature sensor (40) mounted in the transducer (10) for locally sensing a first temperature, T_1, in the transducer (10), and
--- which provides, by means of the at least one temperature sensor (40), at least a first temperature measurement signal (θ_1) representing the first temperature, T_1, in the transducer (10); and
- meter electronics (50) which, using at least the first measurement signal (s_1) and a first correction value (K_1) for the at least first measurement signal (s_1), derive at least one measured value (X) currently representing the physical variable, particularly a measured mass flow rate value, density value, viscosity value, or pressure value,

- wherein during operation, the meter electronics (50) determine the first correction value (K_1) from a temporal variation of the at least first temperature measurement signal (θ_1) by also taking into account temperature values sensed in the past by means of the first temperature sensor (40).

2. A process meter as claimed in claim 1 wherein during operation, the meter electronics respond to a change in the first temperature measurement signal (θ_1), corresponding to a change in the first temperature, with a change in the first correction value (K_1) after a time delay.

3. A process meter as claimed in claim 1 or 2

- wherein the sensor arrangement (60) comprises at least a second temperature sensor (41) mounted in the transducer (10), particularly in spaced relationship from the first temperature sensor (40), for locally sensing a second second temperature, T_2, in the transducer (10), and
- wherein by means of the second temperature sensor (41), the sensor arrangement (60) provides at least a second temperature measurement signal (θ_2), representing the second temperature, T_2.

4. A process meter as claimed in claim 3 wherein the meter electronics (50) determine the first correction value (K_1) by also using the second temperature measurement signal (θ_2).

5. A process meter as claimed in claim 3 or 4

- wherein the meter electronics (50) determine a second correction value (K_2) from a temporal variation of at

least the second temperature measurement signal (θ_2), and

- wherein the meter electronics (50) derive the measured value (X) by also using the second correction value (K_2).

6. A process meter as claimed in any one of the preceding claims wherein the meter electronics (50) comprise a filter stage (FS) for deriving the at least first correction value (K_1), with the first temperature measurement signal (θ_1) being applied to a first signal input of the filter stage (FS).

7. A process meter as claimed in claim 6 wherein the filter stage (FS) comprises a first A/D converter (AD_1) for converting the first temperature measurement signal (θ_1) to a first digital signal (θ_{1D}).

8. A process meter as claimed in claim 7 wherein the filter stage comprises a first digital signal filter (SF_{1D}) for the first digital signal (θ_{1D}).

9. A process meter as claimed in claim 8 wherein the first digital signal filter (SF_{1D}) is a recursive filter.

10. A process meter as claimed in claim 8 wherein the first digital signal filter is a nonrecursive filter.

11. A process meter as claimed in claim 5

- wherein the filter stage (FS) also serves to derive the second correction value (K_2), in which case the second temperature measurement signal (θ_2) is applied to a second signal input of the filter stage (FS), and

- wherein the filter stage (FS) comprises a second A/D converter (AD_2) for converting the second temperature measurement signal (θ_2) to a second digital signal (θ_{2D}).

12. A process meter as claimed in claim 7 wherein the filter stage comprises a second digital signal filter for the second digital signal (θ_{2D}).

13. A process meter as claimed in any one of the preceding claims wherein the transducer comprises at least one flow tube (13) for conducting the, particularly flowing, medium.

14. A process meter as claimed in claim 13 wherein at least one of the two temperature sensors (40, 41) is mounted on the flow tube or in the vicinity thereof.

15. A process meter as claimed in any one of claims 13 to 19 wherein the transducer (10) comprises a transducer case (100) enclosing the flow tube (13).

16. A process meter as claimed in claim 15 wherein at least one of the temperature sensors (40, 41) is fixed to the transducer case (100) or positioned at least in the vicinity thereof.

17. A process meter as claimed in any one of claims 13 to 16

- wherein the transducer (10) further comprises a, particularly electrodynamic electromagnetic, vibration exciter (16) electrically connected to the meter electronics (50) for driving the flow tube (13), and

- wherein the meter electronics (50) provide at least one excitation signal (i_{exc}) for controlling the vibration exciter (16), so that in operation, the flow tube (13) is vibrated at least intermittently.

18. A process meter as claimed in claim 17

- wherein the first sensor (17) responds to vibrations of the flow tube (13), particularly to inlet-side or outlet-side vibrations, and
- wherein the measurement signal (s_1) provided by the first sensor (17) represents mechanical vibrations of the vibrating flow tube (13) which are influenced by the process medium.

19. A process meter as claimed in claim 17 or 18 wherein the transducer (10) comprises a supporting element (14) fixed to the flow tube (13), particularly a supporting element (14) mounted in the transducer case (100) so as to be capable of vibratory motion, for supporting the vibration exciter (16) and at least the first sensor (17).

20. A process meter as claimed in claim 19 wherein at least the first temperature sensor (40) is fixed to the supporting element (14) or positioned at least in the vicinity thereof.

21. A process meter as claimed in any one of claims 1 to 20

- wherein the sensor arrangement (60) comprises at least a second sensor (18) for providing at least a second measurement signal (s_2) in response to the physical process variable, and
- wherein the meter electronics derive the measured value by also using the second measurement signal.